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3-D Hydrodynamic Effects of Pointing and Power Balance Errors on Nova Capsule Implosions*

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We report calculations of the effects of random laser pointing and power balance errors on indirectly driven Nova capsule implosions. Drive asymmetry is calculated with a view factor code, and the implosions are calculated with the HYDRA 3-D radiation hydrodynamics code. Perfect laser power balance and alignment give, with vacuum transport, an intrinsic drive asymmetry dominated by the pole-to-waist variation ($Y_{2,0}$ spherical harmonic) and components associated with the laser spots which have an $Y_{1,m=5}$ azimuthal variation. Errors in the power balance and pointing between beams introduce a complex combination of spherical harmonics into the radiation drive asymmetry. The low mode perturbations which develop in the capsule are found to be as significant as those caused by the intrinsic azimuthal variation. Large variations in the shape of the fuel region result, making it more vulnerable to other perturbations seeded by surface roughness, which grow at the fuel-pusher interface. When the drive errors are sufficiently large, jets of pusher material form. We examine the impact of the overall drive asymmetry, acting alone or combined with other effects, on Nova capsule performance.

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